FARMLINE

United States Department of Agriculture

Economic Research Service

Volume xx, Number x, May 199x

Crop Rotations: Still the Norm

TAKE PRIDE IN AMERICA™

Editor
Al Veerhoff

Assistant Editors
Judith Foulke
Doug Martinez
Wendy Pinchas

Art Director
Barbara Allen

Editorial Assistant
Martha Evans

Composition
Joyce Bailey

Cover Design
Victor Newman

(202) 786-1494

Contents of this magazine may be reprinted without permission.

FARMLINE is published 11 times a year by USDA's Economic Research Service. Send questions, requests, and editorial comments to *FARMLINE*, Room 228 USDA, 1301 New York Avenue NW, Washington, DC 20005-4789.

Please include your mailing label with change-of-address and other requests related to your subscription.

Subscriber price is $12 per year to U.S. addresses ($15 foreign). Individual copies are $8. For fast, personal service, call our order desk toll-free at **1-800-999-6779** (open weekdays 8:30-5:00 Eastern time), and charge your order to MasterCard or VISA. When ordering by mail, make your check or money order payable to ERS-NASS and send to: ERS-NASS, P.O. Box 1608, Rockville, MD 20849-1608. Ask for *FARMLINE*. Include your complete address with ZIP code and daytime telephone number. Sorry, but refunds cannot be issued.

Use of commercial or trade names does not imply approval or endorsement by USDA.

PERSPECTIVES

THERE WERE 266,600 FEWER FARMS IN THE UNITED STATES when the 1980's ended, a decline of nearly 11 percent between 1980 and 1989. Although the decade encompassed the most financially stressful period for farming since the Great Depression, farm exits are only one measure of the stress, say two USDA economists. Farm business failures, while catastrophic to the persons involved, typically have limited impact on the sector as a whole. Nevertheless, economists Jerome Stam and Steven Koenig of the Economic Research Service say, policymakers, agribusiness interests, rural advocacy organizations, and the news media frequently ask for data about forced exits from farming. But reliable figures are hard to develop.

Two useful sources of data about farm failures had already dried up when the recession swept through the agricultural areas in the early and mid-1980's. A 1979 law caused the Administrative Office of the U.S. Courts to discontinue collecting statistics that identified types of businesses filing for bankruptcy. In 1981, USDA stopped keeping records on farm ownership transfers, because of methodological problems with the survey. The USDA files had indicated whether a change was voluntary, an estate settlement, a foreclosure, or for other reasons. Even had both survey sources been available, the economists say, they would have furnished only partial farm-failure data. For instance, failing farmers can sell or otherwise transfer land to avoid foreclosure or bankruptcy. And it appears that during the 1980's some displaced farmers with good management skills later returned to farming with rented land and equipment.

Changes in farm numbers, say Stam and Koenig, involve three variables: farmer retirements, early farmer departures, and entries of new farmers. All can be affected by changes in the economy. Financial stress can cause involuntary early departures, hasten retirements, postpone entries until start-up prospects are better, and perhaps delay voluntary farm sales until land prices improve. "In a normal year," report Stam and Koenig, "3 to 4 percent of farm operators cease farming for a variety of financial and personal reasons." In the mid-1980's, the rate was estimated at 5 to 6 percent, and financial stress accounted for only about half of the exits.

By historical standards, the change in farm numbers in the 1980's was not out of line. The 266,600 drop compares with the 195,800 decline during the 1930's, the time of the Great Depression, and the percentage rate of change was the lowest since the 11.1 percent decline in the 1940's. The sharpest drop in farm numbers was during the 1950's: 1.69 million farms, or 30 percent. Definitional changes by the Census Bureau in 1950, 1959, and 1974 also narrowed the farm category and reduced the numbers somewhat more than otherwise would have been the case. For example, the 1974 change excluded 152,110 farms. When numbers are adjusted to compensate for the 1974 change in definition, the average annual decline in farms for 1980-89 was almost the same as for 1970-80.

Stam and Koenig estimated farm financial stress by analyzing data on total farm debt and lender reports on delinquent loans, bankruptcies, and other liquidations by farm borrowers. By ERS calculations, some 200,000 to 300,000 farmers during the 1980-88 period became bankrupt, went into foreclosure and/or were financially restructured. This number represented 8 to 12 percent of all the farmers operating in 1980. "Despite their business failure," the economists note, "a number of these operators remained in farming, but typically at a greatly reduced scale of operation."

Al Veerhoff

FARMLINE

AGRICULTURE...NATURAL RESOURCES...RURAL DEVELOPMENT
Practical economic intelligence from USDA's Economic Research Service

FEATURES

Crop Rotations: Still the Norm *by Judith Foulke* 4

Concern that continuous cropping is a prevalent practice prompted ERS economists to study the 3-year planting practices of seven major crops. They found that on 80 percent of the nation's farmland, crops are rotated.

Independent Firms Survive Better in Rural Areas *by Doug Martinez* 7

Bringing large corporate-affiliated firms to rural areas is not always the answer to rural employment needs. Smaller, independent businesses seem better able to survive, even in hard times—and development strategies might take that into account, an economist says.

Conservation Compliance Carries High Price Tag for Some Producers *by Judith Foulke* 10

The 1985 farm bill requires farmers who grow crops on highly erodible land to prepare soil conservation plans. Almost all have filed them in their districts, but implementing the conservation plans could be expensive, especially for farmers in the Plains states. If they do not comply, they will lose their eligibility for USDA programs.

DEPARTMENTS

Agricultural Roundup: Planting Intentions 14

Reports in the News: CRP Benefits; Farm Programs and Futures 16

Farmline Trends: Monthly Price Monitor; Off-Farm Income 18

Crop Rotations: Still The Norm

At least 80 percent of the nation's 1988 harvested cropland was planted in crop rotations for the 2 previous years, according to two USDA economists.

The economists studied the 3-year rotations of seven major crops because there is concern that continuous cropping is a prevalent practice. Such monoculture farming may require the use of agricultural chemicals to replace essential crop nutrients in order to achieve steady yields year-to-year.

The study showed that on the average, in 80 percent or more of the acreage in major field crops, farmers used 5 to 10 cropping patterns over a 3-year period. But in many states only 2 or 3 were used.

The exception is cotton. About 50 percent of the 1988 cotton acreage had been used continuously for that crop for at least 3 years.

Economic Research Service economists Stan Daberkow and Mohinder Gill, who did the study, say that concern about water and soil quality and conservation, mostly because of perceived excessive use of chemicals on crops, has prompted research programs and policy proposals to encourage more crop rotations.

Rotation with legumes increases the nitrogen content of soil, providing a natural fertilizer. Also, plant diseases, insects, and weeds can be controlled by not continuously planting the same crop, reducing the need for insecticides and herbicides.

Additionally, crop rotations can help to conserve soil. The right types of rotations can reduce erosion and moisture loss, and can prevent nutrient loss by leaching and runoff. Organic matter and water-holding capacity of the soil may also be increased.

There are also good economic reasons for rotating crops, say the researchers. Soil fertility and preservation can contribute to higher yields with the opportunity for greater profits. Also, farmers can enter the market with different combinations of crops, possibly reducing risk and taking advantage of price fluctuations.

But despite the benefits attributed to crop rotations, about 20 percent of U.S. farmland is continuously planted with the same crop. In some areas, alternative crops are not feasible because of climate conditions. In other cases, planting in rotations is not economically sound because of investments in equipment and expertise.

Programs such as Best Management Practices, Integrated Pest Management, and USDA's Low Input Sustainable Agriculture stress crop rotations as a valuable tool.

The Daberkow-Gill study, using data from the Cropping Practices Survey conducted by the National Agricultural Statistics Service, looks in depth at the 3-year cropping patterns on land used for corn, winter and spring wheat, soybeans, rice, fall potatoes, and cotton production in 1988. They found that with the exception of 1988 crops of cotton in Arkansas, Louisiana, Texas, and Mississippi, irrigated corn in Nebraska, winter wheat in Oklahoma, soybeans in Mississippi, and rice in California, most cropland was involved in some type of rotation during the previous 2 years. □

[Based on information provided by economists Stan Daberkow and Mohinder Gill of the Resources and Technology Division, Economic Research Service.]

How Land for Seven Major 1988 Crops Was Rotated

Following are details about rotations of the seven crops the economists studied:

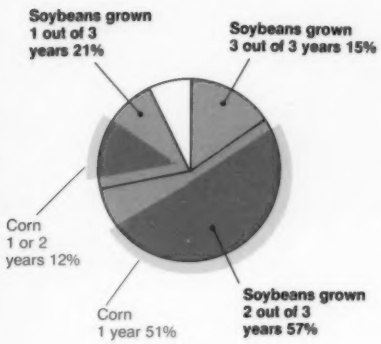
Corn—Two common cropping patterns in the 10 major corn-producing states are continuous corn production and corn-soybeans-corn rotations.

The continuous corn pattern was most common in Nebraska, where 62 percent of the total corn land was monocultured. In Nebraska's irrigated corn acreage, 79 percent of the land was not rotated. The researchers say that fixed investment in irrigation and heavy participation in government commodity programs likely contributed to the lack of crop diversity on Nebraska's irrigated land. Continuous corn cropping consumes greater amounts of insecticide and fertilizer than corn rotated with legumes.

A corn-soybeans-corn rotation pattern dominated in Iowa (59 percent), Indiana (46 percent), and Minnesota (40 percent).

Corn Was the Most Popular Crop for Rotating With Soybeans

Percentage of total U.S. acreage for crop


Soybeans grown 1 out of 3 years 21%
Soybeans grown 3 out of 3 years 15%
Corn 1 or 2 years 12%
Corn 1 year 51%
Soybeans grown 2 out of 3 years 57%

No data available for unshaded area.
Survey covered 49 million acres in 14 states.

In the dairy state of Wisconsin, about 17 percent of the land used to grow corn in 1988 had been planted to alfalfa in the previous 2 years. Alfalfa serves the same purpose as soybeans in a rotation and provides feed for dairy cattle.

In South Dakota, where lack of moisture is a problem, 36 percent of the 1988 corn acres had been planted in wheat or oats during the previous year. With the exceptions of Michigan and South Dakota, over 90 percent of the 1988 corn acreage was used in rotations involving wheat, alfalfa, corn, or soybeans.

Winter Wheat—Most of this crop is grown in the relatively dry Great Plains, where a moisture-conserving, wheat-fallow-wheat pattern is the most common rotation. States following this rotation were Colorado (84 percent), Montana (62 percent), Washington (61 percent), Nebraska (54 percent), Oregon (50 percent), and Kansas (41 percent). Summer fallowing also helps control weeds, insects, and plant diseases by interrupting their life cycles.

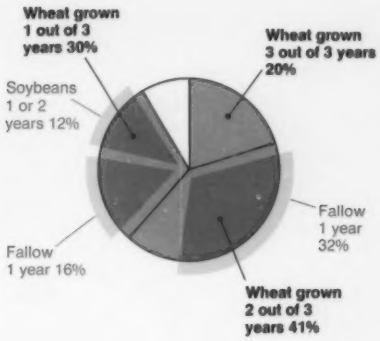
In parts of Texas, Kansas, and Oklahoma, enough moisture is available to permit continuous wheat growing. Winter wheat was produced continuously for 3 years in Oklahoma (70 percent), Texas (41 percent), and Kansas (17 percent).

In the Corn Belt states, where moisture is more abundant, corn or soybeans are common rotations with winter wheat. States which rotated 1988 winter wheat with soybeans in 1987 and corn in 1986 were Illinois (62 percent), Indiana (59 percent), and Ohio (47 percent). Soybeans were also used in winter wheat rotations in Arkansas and Missouri. Winter wheat and corn, if planted after soybeans, require less commercial nitrogen to attain yield goals because of soybeans' nitrogen-fixing properties.

Montana, and to a much lesser extent, Idaho and Washington are the only states where a barley-fallow-wheat rotation is predominant. A sorghum-fallow-wheat rotation is popular in Kansas and Nebraska because of moisture constraints. Sorghum is also grown in Texas and Missouri as part of a winter wheat rotation. However, some experiments have shown that crops following sorghum are likely to suffer yield losses because sorghum extracts moisture from the soil.

Fallowing Land Was Common Practice Among Winter Wheat Growers

Percentage of total U.S. acreage for crop


Wheat grown 1 out of 3 years 30%
Wheat grown 3 out of 3 years 20%
Soybeans 1 or 2 years 12%
Fallow 1 year 32%
Fallow 1 year 16%
Wheat grown 2 out of 3 years 41%

No data available for unshaded area.
Survey covered 33 million acres in 15 states.

In California, Idaho, and Oregon, less than 75 percent of the winter wheat acreage is rotated with corn, wheat, soybeans, or fallow. These states enjoy a wider variety of alternatives such as alfalfa, vegetables, cotton, sugarbeets, or other specialty crops. In Idaho and Washington, peas are common in rotations, while other vegetables are prominent in Oregon and California.

Spring Wheat—States which rotated spring wheat in 1988 with fallow in 1987 and wheat in 1986 included Montana (65 percent), North Dakota (30 percent), and Minnesota (11 percent).

Where rainfall or irrigation permit, more moisture-intensive crops are grown in the year preceding spring wheat production. In

Idaho, 24 percent of the spring wheat acres were used for potatoes in 1987, and 13 percent grew sugarbeets. In Minnesota, 32 percent of the spring wheat acres were rotated with soybeans in 1987, while 24 percent of the acres in South Dakota were rotated with corn. Farmers in both Idaho and South Dakota rotated spring wheat with a variety of crops other than soybeans, potatoes, corn, and wheat in 1987.

North Dakota is the major durum wheat producing state, and 77 percent of acreage planted to durum in 1988 had been fallowed in the summer of 1987. This rotation is common because of the dry summers typical in that area.

Soybeans—In addition to competing economically with other crops, soybeans provide a natural source of nitrogen and a nonchemical means of controlling insects in some succeeding crops (such as rootworm in corn). Given the same applications of commercial nitrogen, corn and wheat crops planted after soybeans, on average, yield 5-10 percent more than when planted after other crops.

The most common rotation is soybeans-corn-soybeans. Farmers followed this rotation pattern in Iowa (74 percent), Illinois (61 percent), Minnesota (51 percent), Nebraska (43 percent), and Indiana (41 percent).

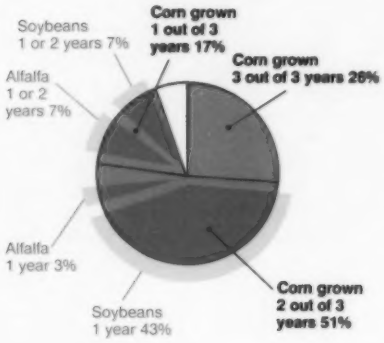
Continuous soybean production was practiced on over one-third of the 1988 soybean acreage in Arkansas, Louisiana, Mississippi, Missouri, Georgia, and Tennessee. When rotations were practiced in Louisiana and Arkansas, rice was the main alternative.

The researchers found that the monoculture of soybeans in the South appears to be a preferred practice. Soybeans receive more herbicides than in the North, but very little insecticide.

In states between the North and South, both continuous soybean production and soybean-corn-soybean rotations are common. About 40 percent of the 1988 soybean land in Kentucky, North Carolina, and Missouri was planted to these two rotations.

Most of the Corn Acreage Was Previously Planted to Legumes

Percentage of total U.S. acreage for crop


Soybeans 1 or 2 years 7%
Corn grown 1 out of 3 years 17%
Corn grown 3 out of 3 years 26%
Alfalfa 1 or 2 years 7%
Alfalfa 1 year 3%
Soybeans 1 year 43%
Corn grown 2 out of 3 years 51%

No data available for unshaded area.
Survey covered 53 million acres in 10 states.

Farmers in Ohio used these rotations to a lesser extent. About 24 percent of Ohio's soybean acreage was in a corn-soybeans-soybeans rotation.

Rice—Rotation practices vary widely. In Arkansas and Louisiana, common rotations are rice-soybeans-rice and rice-soybeans-soybeans. In these states, 20 percent of the 1988 rice acreage was planted to soybeans during the previous 2 years, and another 20 percent was planted to soybeans in 1987 and rice in 1986. In the Delta states, disease, insect, and weed problems prohibit rice production every year.

In California, about 72 percent of the 1988 rice land was continuously planted to rice, 8 percent in a rice-fallow-rice rotation, and 6 percent in rice-fallow-fallow. Most California rice is grown on heavy soils that offer few economic alternatives and on land specifically leveled for rice production.

Cotton—Continuous cotton cropping is widely practiced in the major producing states. States where cotton was continuously planted for 3 years were Louisiana (78 percent), Mississippi (75 percent), Arkansas (64 percent), and Texas (56 percent).

The Delta states average three or more herbicide treatments per acre, while applications elsewhere are slightly more than once per acre. Despite the pressure of increased weeds, monocultured cotton remains the most preferred cropping practice in these states.

In Arizona and California, only about 40 percent of the 1988 cotton land was planted to cotton in 1987 and 1986 because of diverse crop opportunities. Also, insect and weed problems prevent widespread continuous cotton production in California.

Potatoes—Fall potato production occurs in a variety of soil and climate conditions from Maine to Washington. Rotations reflect pest management practices, the availability of other crops, and economic conditions. Less than 5 percent of the 1988 potato acreage produced potatoes in 1987 and 1986.

In Colorado, 68 percent of the potato acreage was planted to barley in 1987 and potatoes in 1986. A significant regional demand for barley for beer production makes this an attractive rotation crop.

Colorado, North Dakota, Minnesota, Idaho, Oregon, and Washington used wheat and barley widely in their 1987 potato rotations. Several states, including Wisconsin, Michigan, Pennsylvania, Oregon, and Washington, grew corn in 1987 instead of potatoes. Alfalfa was also a common rotation crop in Washington, Idaho, Oregon, Wisconsin, and Pennsylvania. In Wisconsin, potatoes were often rotated with other vegetable crops during the previous 2 years.

In New York, potatoes were grown on the same land for 3 years on 25 percent of the 1988 acreage. New York's high-priced potato land, combined with a lack of equally profitable crops, discourages rotations. However, in a number of other states, crop rotations were much more common.

Independent Firms Survive Better In Rural Areas

Smaller, independent business and manufacturing facilities are more likely to survive in rural areas than their larger, corporate-affiliated counterparts.

Economist James Miller of USDA's Economic Research Service came to this conclusion after studying the staying power—and growth potential—of businesses in rural areas.

"Some 53 percent of the independent firms that were started between 1978 and 1980 stayed in business through the 6-year period studied (1980-86), compared with only 39 percent of the affiliates," says Miller.

In fact, he says, independently owned firms in rural areas appear to have greater staying power than independents in urban areas (where the survival rate was 48 percent).

At the same time, however, these rural firms are not growing enough to provide ever more job opportunities for the people in their communities.

"New, independent firms quickly reach their optimum size shortly after starting up," says Miller. "Their rate of employment expansion in nonmetro areas is about half the rate in metro areas."

Even so, such firms grew faster than corporate affiliates in the period studied.

"Most affiliates appear to open with about the maximum number of employees, leaving little potential for growth," says Miller.

These findings suggest that jobs generated by locally owned and operated firms may offer more stability than those provided by bigger and better-known companies affiliated with national or regional corporations headquartered elsewhere. This view seems to be borne out by the work of other researchers as well.

"Several studies have shown that independent firms tend to have lower closure rates than branch plants in a recession," says Miller. "Corporate affiliates, particularly in nonmetro areas, are the first to experience cutbacks of employment and closings during downturns of economic activity."

Even when rural economy was sputtering early in the 1980's, small firms were prolific job creators.

He goes on to say that "independent firms tend to have lower closure rates primarily because they are forced to adjust on site or face the prohibitive cost of moving, whereas parent firms abandon affiliates in hard times and possibly expand at other sites to compensate for the affiliates they have closed. Parent firms are more likely to serve wider, more diversified markets than independent firms, giving them more freedom to shift production geographically over the business cycle."

Other evidence indicates that independent businesses may be better for their communities than corporate affiliates.

"The research done to date backs up the argument that local ownership has advantages over external control for rural areas," Miller says. "Independent firms tend to purchase more from the local area and sell less outside the area, with most of the revenue staying in the community."

Remote Controls

Historically, rural areas in the South and elsewhere have depended on absentee corporations for manufacturing jobs, says Miller.

He notes that such "absentee corporate dominance" may have limited local initiative and enterprise.

"First, vertical integration in manufacturing has discouraged indigenous activity in many small towns and rural places," says Miller. (Under vertical integration, for example, a food processing firm might have its own farms, processing or canning plants, and trucks.) "Affiliates tend to purchase a larger share of their inputs from other parts of the parent corporation in other areas," Miller adds.

In the second place, he says, "the low-skill labor requirements of affiliates have created a dependency on corporate jobs that weakens local entrepreneurship and self-sufficiency."

What may be even more important is the actual number of jobs created by small, independent businesses.

"Many advocates of rural small-firm development justify the expense of new-business development programs by pointing to national studies that show small businesses have created most of the new jobs in the economy," says Miller. "There has also been a noticeable shift of employment growth from large to small firms in the nonmetro economy."

Small firms, he says, pushed up employment in nonmetro areas over the 1980-86 period by an average of more than 5 percent.

Even when the rural economy was sputtering early in the 1980's, small firms were prolific job creators.

Although large firms did recover to create more jobs after 1982, small firms were still responsible for producing about half of the net employment growth in service industries and all of it in traditional goods-producing industries from 1982 to 1986.

Small-business growth, however, has not been uniform across the urban-rural spectrum.

"Rural employment growth in the small-firm sector tended to be different from the mix found in metro areas in the years when companies were coming out of the recession," says Miller. "Small firms in residential services—retail stores, restaurants, household services, and so on—were responsible for a larger percent of the job growth in nonmetro than in metro areas in the period from 1982 to 1986."

Obviously, rural policymakers would like to add better-paying jobs to the rural job mix.

"The success of a small-business development strategy ultimately depends on whether rural areas can attract and nurture small firms that will survive and grow, develop and export new products and services, and provide high-quality jobs," he says.

Moreover, strategies should encourage the growth of companies that develop strong ties to other firms that will generate jobs throughout the local economy, the analyst says.

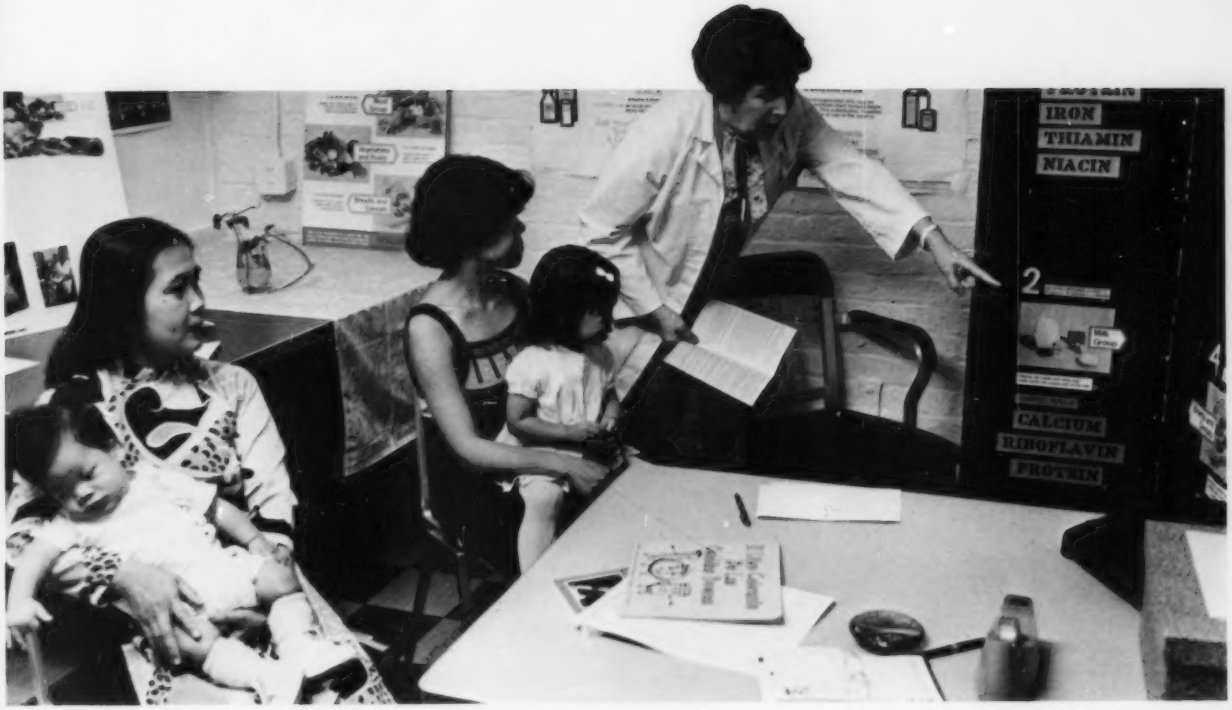
In these efforts, Miller advises, rural officials should be aware of several significant trends.

"Recent studies and projections suggest that expanding world markets, improved communications and production technologies, and changes in corporate organization are leading towards a new organization of production," says Miller. "Firms are getting smaller, more efficient, and more mobile in both manufacturing and service industries for a number of reasons.

First, large corporations are "vertically disintegrating."

"They are becoming smaller and are increasing the number of small firms by contracting out activities that are not a part of either final assembly or core management," he says."

Second, telecommunications and the new information technologies are rapidly increasing the ability of small firms, particularly in service industries, to move information quickly and cheaply. "With communications satellites, cellular tele-



phones, facsimile machines, and microcomputers, small firms are able to compete with large firms in dealing with customers, personnel, and suppliers."

Third, the emergence of new computer-based technology in manufacturing is dramatically improving the productivity of small producers in comparison with large, mass-production firms.

"This new technology enables small producers to take over some of the internal manufacturing processes of large firms," says Miller.

Gauging the Prospects

Are nonmetro areas likely to win or lose against metro areas in the transition to smaller firms and mobile industries?

The answer, says Miller, depends on whether—and to what extent—corporate reorganization, telecommunications, and new technology lead to either centralization or decentralization of economic activity.

"It is far from clear what will happen," he says.

The best prospects may be for rural communities adjacent to urban areas and major state universities. State and local governments can play a vital role, he adds.

"State and local governments may want to encourage flexible specialization' by providing industrial sites and investment incentives, underwriting the cost of training, and providing technical assistance in developing supplier and marketing networks," Miller says. "This strategy is likely to be more successful in nonmetro counties that are within commuting distance of metro areas and major state universities."

Recent research conducted by the Small Business Administration (SBA) suggests that high-technology growth may become more balanced between nonmetro and metro areas in the future.

SBA researchers believe that a combination of state university programs, university-based research parks, joint business-academic endeavors, and an increase in technology transfer programs is bringing technology to small firms in nonmetro areas at a faster rate than in the past.

As the number of cooperative ventures between small high-technology firms and universities continues to increase, small firms are better able to compete with large firms in specific markets. The issue of whether they locate in a nonmetro or metro area becomes less important, Miller says. □

[Based on information provided by economist James Miller of the Agriculture and Rural Economy Division, Economic Research Service.]

Conservation Compliance Carries High Price Tag for Some Producers

Beginning this year, farmers who grow crops on highly erodible land are required to have an approved soil conservation plan on that land in order to qualify for many USDA programs.

Those farming such land, which is about one-third of the nation's cropland, were required to file plans with the USDA detailing how they would prevent or reduce erosion to meet tolerances established under the Conservation Compliance Program (CCP). The plans must be in operation by 1995.

CCP is one of four conservation provisions of the 1985 farm bill. If farmers who own highly erodible cropland choose not to comply with this federal regulation they will lose their benefits from many USDA programs.

Farmers know this. Those who are involved have been advised by their Soil Conservation Districts of the details and the deadlines. But whether or not they choose to comply will depend to a large extent on how much it will cost them individually, both to put the plan into operation and to maintain it.

Regions with high wind erosion seem to be most threatened financially.

Participation in CCP will be costly. USDA economist Wen-yuan Huang of the Economic Research Service estimates that it will cost farmers from $86 million to $2.6 billion annually, depending on whether they are granted hardship relief.

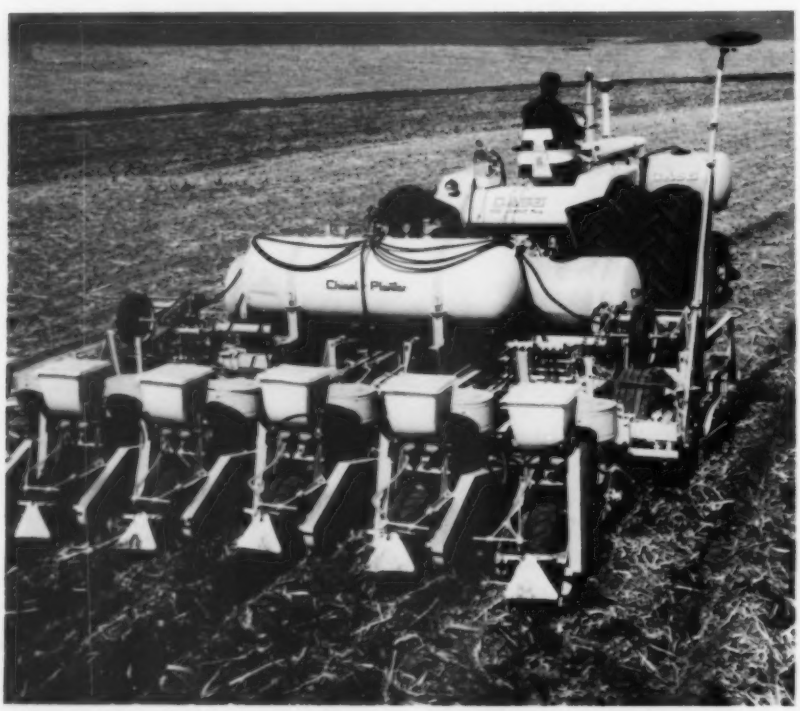
Reports from the U.S. Soil Conservation Service, administrators of CCP, show that nearly all farmers have filed conservation plans. About 27 percent have already started their programs, even though they have until 1995. Huang says, "Between now and then farmers will be watching commodity prices and weighing their gains from participation in government programs against their costs of compliance with CCP before they make their decisions to put their plans into effect."

Even after the conservation programs are in operation, farmers have the option to exit CCP, although, says Huang, most farmers are interested in maintaining soil and water quality. Farmers realize that today's investment in conservation will pay dividends in future productivity. "But when commodity prices are high, close to or exceeding federally set target prices, high market returns will lower farmers' incentives to participate in commodity programs. If a farmer does not participate in commodity programs, he has less incentive to participate in CCP," says the economist.

"When market prices are low and government benefits are high, farmers are more likely to participate in the conservation program as long as the expected commodity program benefits significantly exceed CCP costs," says Huang.

The amount of cropland with the potential for erosion is no small figure. Huang estimates that in 1988, over 135 million acres, about one-third of America's available cropland, was losing more than 5 tons of soil per acre per year. That rate of loss is approximately the maximum rate of erosion that cropland can sustain without losing productivity. Because erosion tolerance can vary according to climate and terrain, the loss limit is identified as T, and it may change from region to region.

The highly erodible lands are concentrated in the Corn Belt, where water erosion is the main problem, and in the Northern Plains, where wind erosion is the major concern.

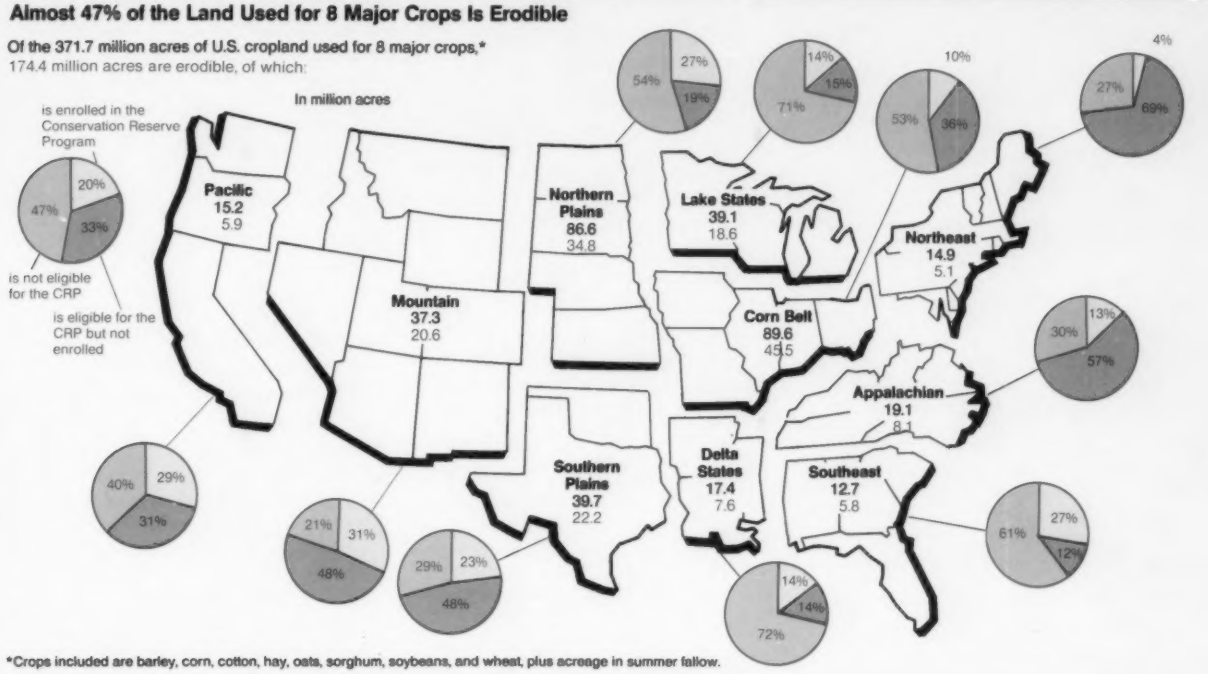


Tillage is reduced and soil is conserved by using chisel planter to seed corn over old corn residues.

CRP Land Overlaps Acreage

The Conservation Reserve Program (CRP), another program created under the 1985 farm bill to promote soil conservation

Almost 47% of the Land Used for 8 Major Crops Is Erodible



*Crops included are barley, corn, cotton, hay, oats, sorghum, soybeans, and wheat, plus acreage in summer fallow.

and water quality, overlaps acreage with the CCP. Under CRP, the federal government pays farmers who own highly erodible and other environmentally critical acreage an annual rental to retire the land from production for 10 years. Some acres may be planted to trees, others to grass but not to be grazed.

As of the latest signup, which was in August 1989, 34 million acres were enrolled in CRP. The federal government has set a goal to enroll 40 to 45 million of the most erodible acres by the end of this crop year. Huang's estimates of the costs of CCP are based on the remaining 95 million acres of cropland with erosion losses higher than T, plus an additional 15 million also considered erodible.

One difference in the two programs is that while CRP idles the land, CCP allows farming but only in ways that would maintain or improve fragile cropland. On CCP land, farmers have at least four options to control erosion: change crop rotations, adopt conservation tillage practices, use conservation field practices, or take land out of crop production.

Using a rotation that switches from row crops (such as corn and soybeans) to close-grown crops (such as wheat and alfalfa) will slow the runoff of rainfall and soil movement by wind. The same type of benefit can be gained with conservation tillage (which leaves crop residue on the soil surface) and other field practices that include terraces, contours, or windbreaks. Retiring land from crop production to permanent pasture minimizes exposure of the soil surface to both rainfall and wind.

However, each of these conservation practices has its tradeoffs, says Huang. Changing to conservation tillage, such as minimum tillage or no tillage, may reduce production costs by requiring fewer field operations. But often, especially in the Corn Belt and regions with warm climates, the

In many areas where the dust devils dance, farming practices that effectively reduce wind erosion are also expensive.

Will CCP Improve or Degrade Ground Water?

One of the benefits of conservation efforts is better water quality. Surface water, generally, is improved with conservation practices. But concerns have been raised regarding the environmental soundness of using tillage and field practices to reduce soil erosion because of their effects on ground water, says ERS economist Wen-yuan Huang.

Reduced soil erosion under CCP would reduce nonpoint-source pollution of streams and lakes, enhancing surface water quality. Conservation tillage would also reduce the potential for pesticide leaching into ground water. The practice promotes the growth of microorganisms on the soil surface, and the bacterial activity helps to degrade pesticides.

But adopting conservation tillage practices such as minimum tillage or no tillage in many areas, including the Corn Belt, may require additional pesticides to maintain crop yield. Also, more herbicides are required on corn with reduced tillage and on soybeans with no tillage, increasing the potential for chemical leaching.

Contouring and terracing will reduce surface runoff and retain water on fields. But these two practices increase infiltration and the potential for pesticide leaching.

Huang says that further research results are required to assess the effects of CCP on ground water quality using current conservation tillage and field practices.

practice may require additional applications of pesticides, which increase costs.

Minimum- or no-tillage operations could result in lower yields if farmers do not have experience with the production technology, says Huang. They may also have to buy new or replace farm machinery for the different farming practices.

Installing terraces and windbreaks adds to the cost of production. Using contour or strip-cropping field operations could also increase production costs, depending on the configuration of the field. Retiring cropland or putting it to other uses can reduce farm income because some highly erodible cropland is also extremely productive.

Government Tallies Costs

Huang says that it is important for policymakers to know how much it costs farmers to comply with the CCP. In regions where conservation compliance could cause financial hardship to individual farmers, USDA has allowed certain alternative conservation systems. These particular conservation practices, tailored to county and soil characteristics, can override the requirement to conform to T levels.

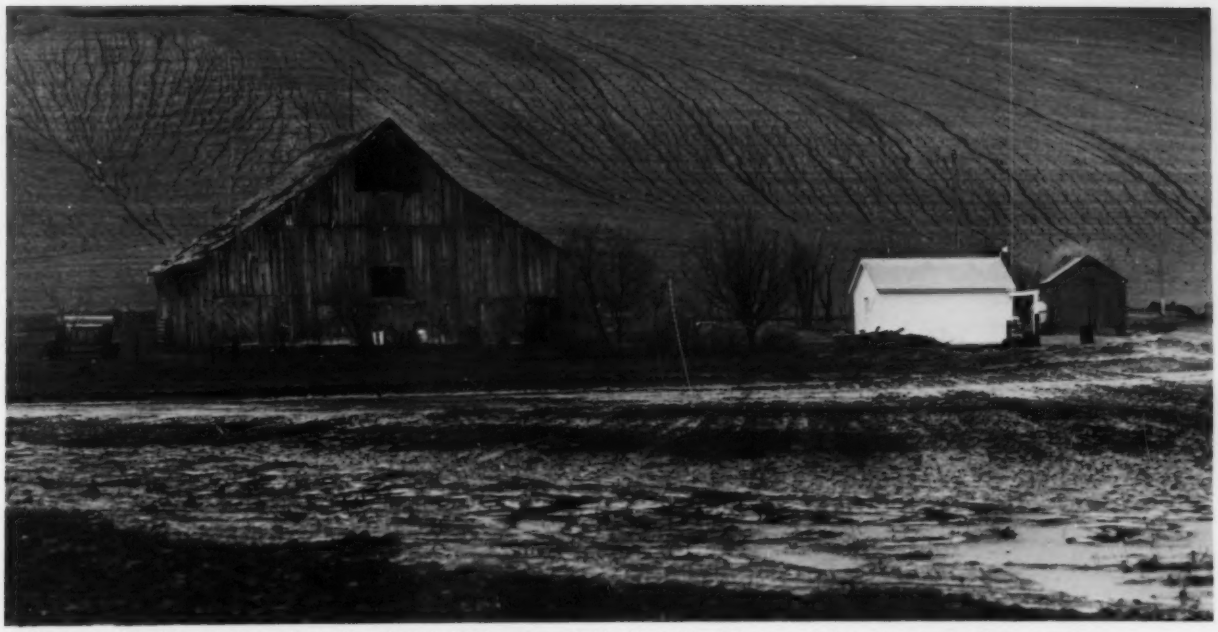
Regions with high wind erosion seem to be most likely to be adversely affected financially because there is no inexpensive tillage or conservation practice that will effectively reduce wind erosion to T. Huang's analysis assumes that farmers would reduce production if available conservation practices could not bring soil erosion to or below T.

If the Conservation Reserve Program reaches its minimum enrollment goal of 40 million acres, Huang estimates that placing the remaining 110 million acres of highly erodible cropland in CCP, including the alternative farming systems, could cost farmers $86 million. Without the alternative systems the cost could soar to $2.6 billion.

The higher estimate counts both income lost from reduced farm output and the increased costs of a change in production practices. Huang says that the alternative farming systems may be used in some problem regions so that farm production can continue at reasonable levels. He says that the higher estimate represents the most that compliance could cost farmers.

If cost reductions in one region to some extent offset the losses in others, the cost of compliance could reach $1.6 billion

Strip cropping is an effective conservation practice but could be costly, depending on the configuration of the field.



This eastern Washington farm, planted to wheat in 1983, represents the kind of land that now falls under conservation programs.

rather than the $2.6 billion no-exemption estimate. The smaller figure still represents a significant net income loss to the U.S. farm sector.

By knowing how much conservation programs cost, policymakers can look at possible implications to government commodity programs. Huang says conservation programs tied to commodity programs must be considered together. "The danger is that farmers who elect not to participate in conservation compliance will reduce the numbers participating in commodity programs. If farmer participation in commodity programs falls below program targets, the objectives of commodity programs (supply control and price stabilization) could suffer. Nonparticipation by farmers could be self-defeating to both programs."

Given the estimated compliance costs and the current downtrend in commodity program benefits, Huang says, most farmers in regions with wind erosion problems, where conservation is most costly, will have little incentive to participate in the compliance program if they must do so without some relaxation in the program criteria.

Knowing the costs of CCP would also help determine possible budget tradeoffs between CCP and CRP, says Huang. Both programs aim to reduce soil erosion and can be substituted for each other in minimizing soil loss. However, the number of acres potentially affected by CCP is far greater than the number eligible for the CRP.

Expansion of CRP enrollment requires an increase in government rental payments for the additional cropland enrolled and cost sharing for establishing vegetation, says Huang. The federal government currently pays $1.7 billion annually in rental costs for the 34 million acres now enrolled in CRP, and $1.3 billion in one-time cost-sharing agreements to establish cover crops on the rented acres. Rental rate for additional CRP acreage could increase if taking land out of production sufficiently impinges on land available for crop production.

Conversely, CCP does not require government expenditures unless a cost-sharing program is devised to provide economic incentives for farmers to comply. Even with a cost-sharing program, Huang's estimates show, it costs the government considerably less for a conservation program under CCP. Huang adds, "However, conservation is virtually assured under CRP but not totally under CCP." □

[Based on information provided by economist Wen-yuan Huang of the Resources and Technology Division, Economic Research Service.]

AGRICULTURAL ROUNDUP

Planting Intentions: More Corn, More Wheat

U.S. farmers may plant more acreage to grains but less to soybeans this year than they did last year, according to USDA's March survey of farmers' planting intentions.

The combined acreage to be seeded in grains (wheat, coarse grains, and rice) and soybeans is estimated at 246.0 million for 1990, almost identical to the 246.2 million acres seeded to those crops in 1989. The total acreage intended for coarse grains (feed grains) is essentially the same as last year's 106.2 million. Wheat acreage is expected to be up about 1 million, and rice plantings will be about 150,000 acres more. Soybean acreage will be down more than 1 million.

The data on planting intentions were gathered through mid-March by the National Agricultural Statistics Service of USDA, from voluntary responses by some 75,000 farmers and ranchers. The data furnished mostly represent planned crop acreage.

Planting operations—which are dependent on weather, soil conditions, market conditions, government programs, and other factors—may begin for some crops as late as 6 weeks after the survey. The results may be different from what has been reported, explains economist Jim Cole of USDA's Economic Research Service. Actual corn plantings, for example, may be as much as 1.5 million acres higher or lower than what farmers said they intended to plant, Cole says. The wheat area will not vary as widely, since much of the crop already has been planted.

NASS will make another tally of crop acreage in June and furnish the results on June 28.

Proportionally, the greatest planting increase expected among the major U.S. crops is the 17-percent rise (almost 1.9 million acres) in cotton acreage, to 12.4 million. Farmers in Texas, Mississippi, and California, in order of rank, which have about five-eighths of the cotton acreage, said they planned to raise plantings by 1.2 million acres, an 18-percent rise. The cotton acreage-reduction requirement for this year has declined to 12.5 percent, encouraging cotton plantings. It was 25 percent in 1989.

The largest percentage reduction for grains is the anticipated 12-percent decline (400,000 acres) in durum wheat plantings, to 3.4 million acres, because durum grain prices, relative to those for hard red spring wheat, have been depressed. Eighty-five percent of U.S. durum wheat acreage is in North Dakota, where plantings are expected to be down by 8 percent (250,000 acres) to 2.8 million acres. Farmers in that state increased winter wheat acreage by 150,000 and may increase other spring wheat acreage by 300,000.

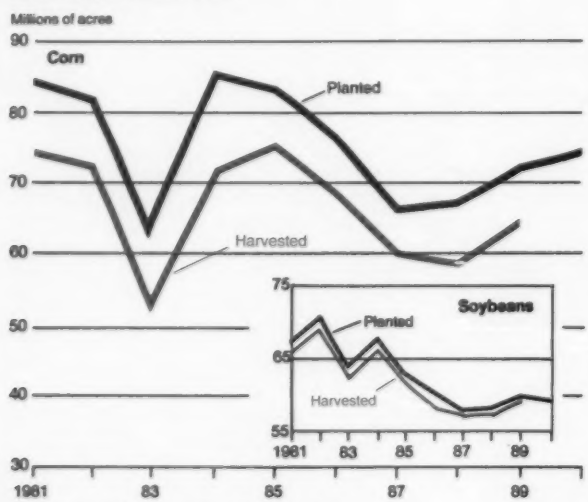
Planting intentions for other spring wheat nationwide dropped 4 percent to 17.0 million acres. Major acreage changes for this category, in addition to the rise in North Dakota, are decreases of 700,000 in Washington and 600,000 in Montana, and an increase of 300,000 in Minnesota.

Corn growers said they will plant 74.8 million acres this year, 4 percent more than in 1989, and the fourth straight year that plantings have risen. The 2.5-million-acre increase is the largest area change among the major crops. Plantings for the other feed grains—oats, barley, and sorghum—will be smaller. Cole attributes the larger area to government programs that stimulate corn production and to farmer responses to lower corn and wheat inventories. He says Corn Belt farmers also are keeping an eye on late and large anticipated Brazilian soybean marketings that could soften bean prices relative to corn.

Intended corn plantings will increase by only 1 percent (500,000 acres) in the four states that together have one-half of the corn acreage: Iowa, Illinois, Nebraska, and Minnesota, in order of rank. Plantings will increase by 7 percent (1.1 million acres) among the states ranking 5 through 8 and holding just under one-fourth of the total corn acreage: Indiana, Wisconsin, Ohio, and South Dakota.

The 2.1-million-acre increase in seeded winter wheat was a 4-percent rise over plantings in the fall of 1988. Much of

Farmers Plan to Shift Some Acreage From Soybeans to Corn



[1]Planted in preceding autumn. [2]Includes durum wheat.

the increase is among seven states, which rank 4th through 10th in acreage and represent 29 percent of the national winter wheat acreage. The year-to-year gain is 1.2 million acres (8 percent) among the seven: Colorado, Montana, Nebraska, Washington, Missouri, Illinois, and South Dakota, in order of rank. About 46 percent of the nation's winter wheat cropland is in Kansas, Oklahoma, and Texas, and among these three states the rise in plantings was 100,000 acres (0.4 percent).

Planned soybean acreage is down by 1.2 million (2 percent) to 59.4 million, a reduction that appears to be evenly dispersed among most of the major producing states. Last year, six states had at least 4 million acres each planted in soybeans. They had 58 percent of the total U.S. soybean acreage and they may have 58 percent again this year. The reduction this year for the six is more than 500,000 acres (2 percent of the combined 1989 total). The states—Illinois, Iowa, Minnesota, Indiana, Missouri, and Ohio, in order of rank—are increasing corn acreage by 1 million and winter wheat acreage by more than 700,000.

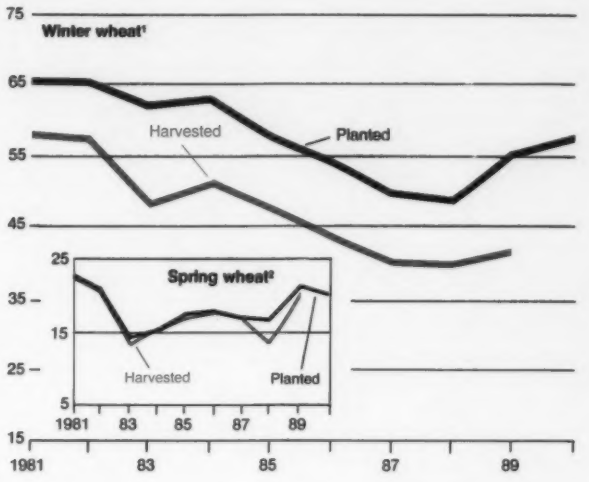
The shift in soybean intended acreage was expected, says Cole, because U.S. farmers are aware that Brazil will market a huge crop this year.

Planting intentions for other crops:

- Sorghum acreage down 9 percent to 11.5 million. The top states, Kansas and Texas, reported intended planting drops of 400,000 acres each.
- Oats acreage down 9 percent to 11 million. Roughly 6.3 million acres will be harvested and the remainder of the crop will be left as a cover.
- Barley acreage down 3 percent to 8.9 million. North Dakota and Montana, the biggest producing states, will have about the same acreage as in 1989.
- Rice acreage up 6 percent to 2.9 million. The change is fairly evenly distributed among five of the rice-growing states: Arkansas, Louisiana, Mississippi, Missouri, and Texas. Water shortages are expected to hold California's increase to about 2,000 acres.
- Hay down 2 percent to an intended 62 million acres, the third year that area has dropped.
- Dry edible bean acreage up 11 percent to 2.1 million, the third year in a row that plantings have increased.
- Peanut acreage up 3 percent to 1.7 million, the fifth year in a row that plantings have increased.
- Sugarbeet acreage up 5 percent to 1.4 million. Plantings have increased every year since 1982.
- Tobacco acreage up 6 percent to 731,000, the largest area since 1984.

—Al Veerhoff

Winter Wheat Plantings Up 4%, Spring Wheat Down 5%



REPORTS IN THE NEWS

CRP Seen as Boost to Net Farm Income

The Conservation Reserve Program (CRP) will boost net farm income and improve environmental quality, according to this report. The net economic benefits of the program through 1999 could be as much as $11 billion, the authors say.

The report looks beyond bottom-line estimates to determine how well the CRP does in reaching each of its goals. The environmental benefits, estimated at $6 billion to $13.6 billion over the life of the program, will be felt mostly in off-farm areas affected by agricultural soil erosion, according to the ERS analysts who authored the report.

Other effects of the program will include somewhat higher food prices and government administrative expenses, plus potential down turns in farm input industries and other local economic activity tied to farming where CRP enrollment is heavy.

A 45-million-acre CRP will cost the federal government $21.5 billion to $22.8 billion in rents, bonuses, cost sharing, and technical assistance, the report concludes. Most of these costs are offset by savings in support payments to farmers.

The authors note that the CRP's progress must be measured against the other effects that the program has on the overall economy.

The Conservation Reserve Program: An Economic Assessment by C. Edwin Young and C. Tim Osborn. Published February 1990; 36 pages $8; ($10 to non-U.S. addresses).

From Loan Rates to Trading Pits

Could futures and options markets be used instead of government commodity programs to provide U.S. farmers with price stability and income protection?

This was one question that Members of Congress had in mind when they asked the USDA to study the ways that farmers might use these markets.

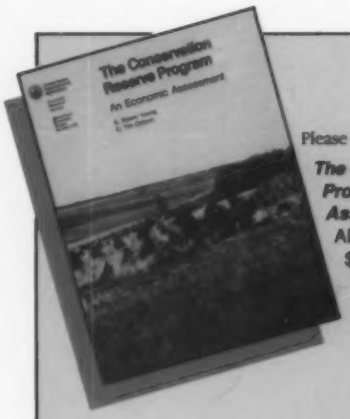
This report is part of USDA's response to that congressional directive in the Food Security Act of 1985.

One general conclusion: By using commodity futures, options, or cash forward contracts, farmers can broaden their pricing alternatives and partly protect themselves against price declines within a given year, but they cannot effectively stabilize their incomes across years.

The report concludes that government programs to expand use of such contracts by farmers generally would not raise or stabilize market prices or farmers' incomes unless subsidies were involved. Such subsidies would be difficult to administer and would offer few advantages over conventional farm programs, the authors say.

Three related reports are also available: "Futures, Options, and Farm Programs: Report to Congress on a Study Mandated by the Food Security Act of 1985" (AGES 9003), $8; "Subsidized Put Options as Alternatives to Price Supports" (TB-1773), $5.50; and "Effects of a Subsidized Put Option Program and Forward Selling on Farmers' Revenue Risks" (TB-1777), $5.50.

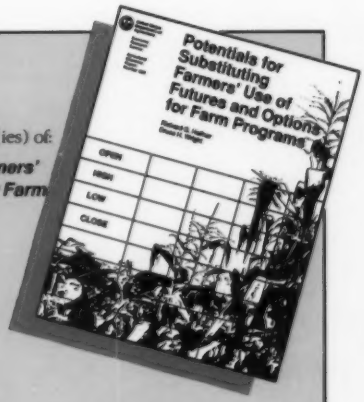
Potentials for Substituting Farmers' Use of Futures and Options for Farm Programs by Richard G. Heifner and Bruce H. Wright. Published December 1989; 84 pages; $8 ($10 to non-U.S. addresses).



Mail Order Form To:
ERS-NASS
P.O. Box 1608
Rockville, Maryland 20850

Please send me ____ copy(ies) of:
The Conservation Reserve Program: An Economic Assessment
AER-626
$8 ($10 outside U.S.)

Please send me ____ copy(ies) of:
Potentials for Substituting Farmers' Use of Futures and Options for Farm Programs
AER-628
$8 ($10 outside U.S.)



Total charges $ _____

Name _____

Address _____

_____

City, State, ZIP _____

Daytime phone ( ) _____

☐ Enclosed is $ _____ (make check or money order payable to ERS/NASS. Do not send cash.

Charge order to my
☐ MasterCard
☐ VISA

Account Number: ☐☐☐☐-☐☐☐☐-☐☐☐☐-☐☐☐☐

Expiration date: (Month/Year) ☐☐/☐☐

For fast, personal service, call our toll-free number 1-800-999-6779 and charge your order to MasterCard or VISA. Phone lines are open weekdays, 8:30-5:00 Eastern Time.

ERS-NASS Video Tapes

☐ **ERS: Economic Research for American Agriculture**

An historical account of the role of economic research in the success of American agriculture.

16 1/2 minutes.
Order No. VT001 $15.00

☐ **Today and Tomorrow**

The U.S. Department of Agriculture's Outlook program analyzes the current situation for U.S. and world crops, and provides a forecast of future supplies and prices. "Today and Tomorrow" is an overview of the USDA Outlook program from its beginning in the 1920's, to the current comprehensive program of research and analysis.

23 minutes.
Order No. VT002 $15.00

☐ **The Need To Know**

Begins with a futuristic "what if?" opening, and then proceeds to outline the history, significance, and contributions of agricultural statistics and USDA's National Agricultural Statistics Service.

23 minutes.
Order no. VT003 $15.00

☐ **Your Hometown**

"Your Hometown" is an informative and entertaining look at small town rural America. Originally seen on public television stations nationwide, and narrated by James Whitmore, the program focuses on three rural communities where citizens use innovative thinking and teamwork to revitalize their own towns.

1 hour.
Order No. VT004 $15.00

☐ **Alternative Agriculture: Growing Concerns**

Can U.S. farmers produce at a profit while practicing low-input, sustainable agriculture (LISA)? "Growing Concerns" investigates the benefits and drawbacks of LISA. An excellent overview, this documentary was originally seen as a five-part series on national television.

19 minutes.
Order No. VT005 $15.00

☐ **Ethanol: Economic and Policy Tradeoffs**

Ethanol can contribute to the national goals of energy security, a clean environment, and a healthy rural economy, but there are tradeoffs.

25 minutes.
Order No. VT006 $15.00

For fastest service, call toll free, 1-800-999-6779
(8:30-5:00 E.T.in the U.S. and Canada; other areas, please call 301-725-7937)

- **Check selections above.**
- **Use purchase orders, checks drawn on U.S. banks, cashier's checks, or international money orders.**
- **Make payable to ERS-NASS.**
- **Add 25 percent extra for shipments to foreign addresses (including Canada).**
- **Sorry, no refunds**

Name _____

Organization _____

Address _____

City, State, Zip _____

Daytime phone _____

☐ Bill me. Enclosed is $_____ ☐ MasterCard ☐ VISA Total charges $_____

Credit card number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

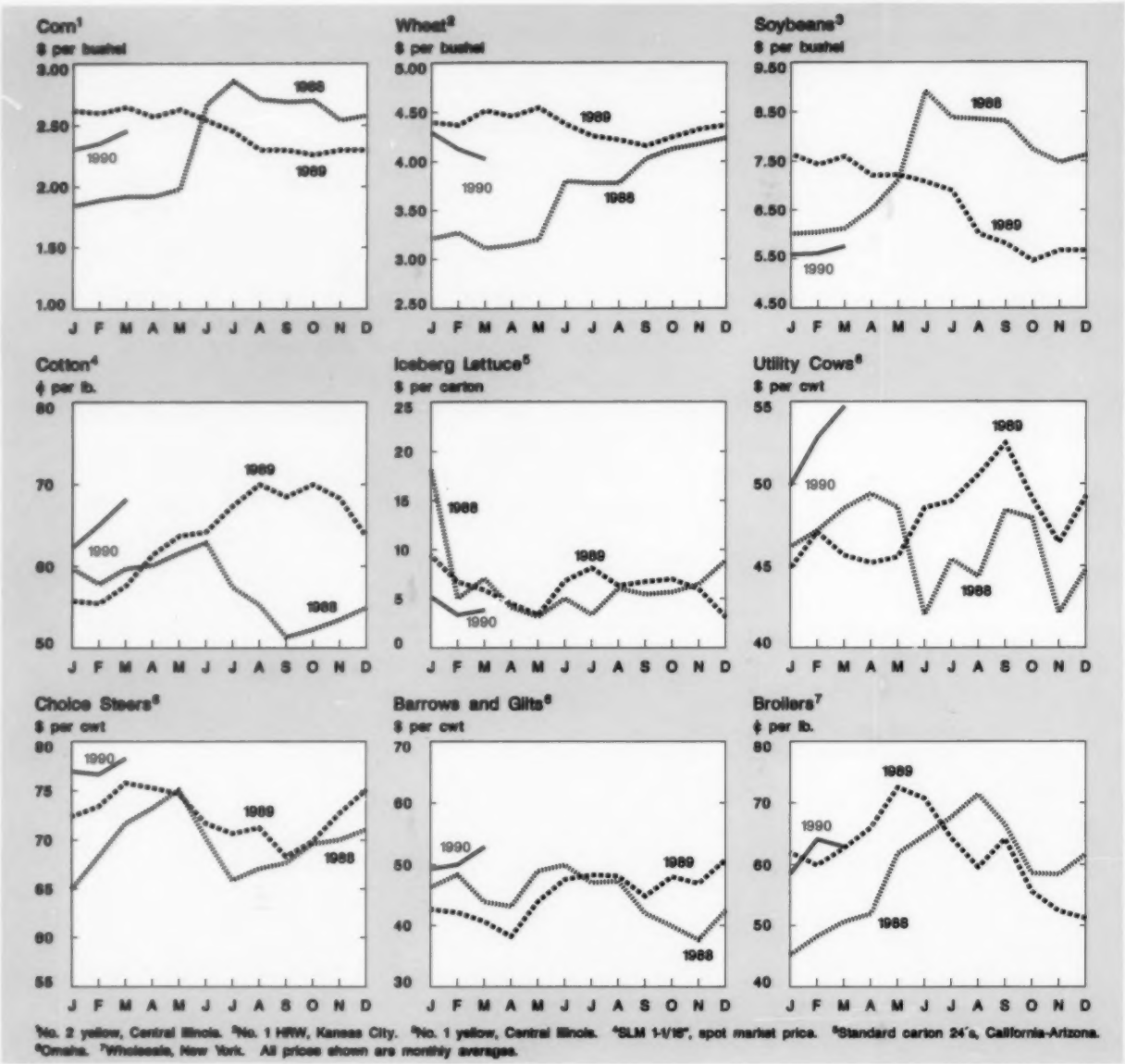
Expiration date ☐☐ ☐☐ Month Year

Mail to: **ERS-NASS**
P.O. Box 1608
Rockville, MD 20849-1608

FARMLINE TRENDS

Monthly Price Monitor

USDA's March 1990 inflation-adjusted index of farm prices increased 1.3% from February and was 2.7% above its year-earlier level. Corn rose 10¢ to $2.45 per bushel, a level it last reached 8 months earlier. Wheat prices, down 10¢ to $4.02, were the lowest in 18 months. Soybeans, up 15¢ to $5.74 per bushel, were at their highest level in 5 months. Cotton increased just over 3¢ per pound to 68.1¢. Iceberg lettuce gained 50¢ to $3.75 per carton. Among meat animals, utility cows continued strong with prices at $54.67 per hundredweight, up $1.88. Choice steers rose $1.59 to $78.19 per hundredweight. Barrows and gilts rose $2.84 to $52.77 per hundredweight. Broilers were down 1.2¢ to 62.8¢ per pound.



[1]No. 2 yellow, Central Illinois. [2]No. 1 HRW, Kansas City. [3]No. 1 yellow, Central Illinois. [4]SLM 1-1/16", spot market price. [5]Standard carton 24's, California-Arizona. [6]Omaha. [7]Wholesale, New York. All prices shown are monthly averages.

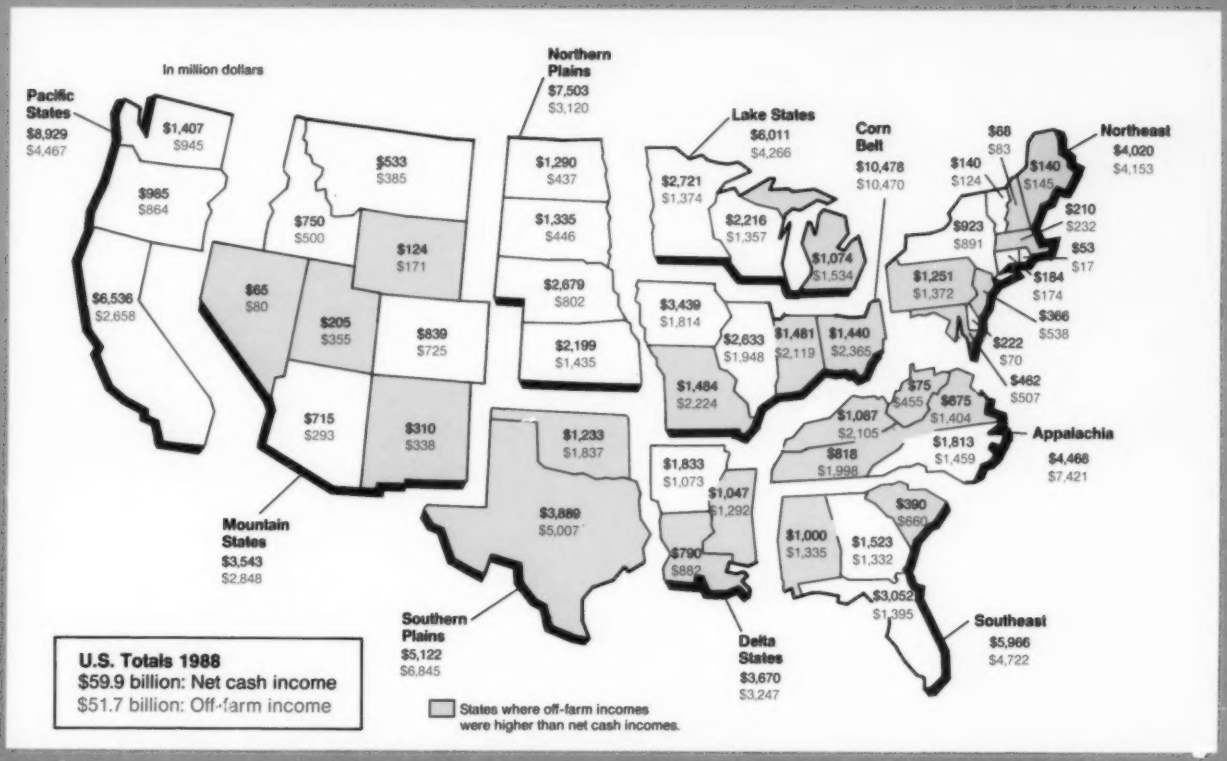
Net Cash Incomes Reach Record Highs

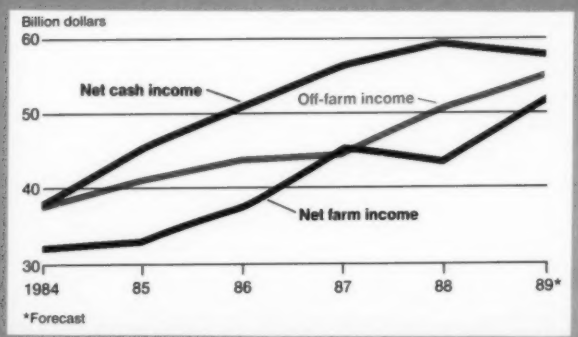
But Farmers in Half the States Still Earn More in Off-Farm Jobs

Generally, salaries that farmers earn on jobs off their farms supplement their farm incomes. But in 1988, farmers in 25 states brought home larger paychecks than they earned on their farms, even though net cash incomes from farms reached a nationwide record high of $59.9 billion, an average of $17,400 per farm. The total off-farm income was also a record $51.7 billion.

Net cash income is all cash transactions from farming and is calculated as gross cash income such as cash receipts and direct government payments, minus cash expenses such as seed, feed, fertilizer, property taxes and interest. It does not include noncash income such as the value of net change in inventories, or noncash expenses such as depreciation of buildings or equipment.

Most states where off-farm incomes were higher had strong industrial bases and smaller sized farms, says economist Bob Williams of USDA's Economic Research Service. One of the reasons Texas farmers have the highest off-farm incomes in the country is that many have petroleum resources on their lands. California has the country's highest net cash income because of the high-value farm products it produces, says Williams.





Net farm income includes noncash income, such as the year-end value of farm inventories, and noncash expenses, such as depreciation. Except for 1987, annual totals for off-farm income have fallen between the net cash and the net farm income, with net farm income the lowest.

—Judith Foulke

Observations and data provided by Bob Williams of USDA's Economic Research Service.

United States
Department of Agriculture
Washington, DC 20005-4789

OFFICIAL BUSINESS
Penalty for Private Use, $300

To change your address, send mailing label on this magazine and new address to *FARMLINE*, Rm. 228-USDA, 1301 New York Ave. NW, Washington, DC 20005-4789

BULK RATE
POSTAGE & FEES PAID
U.S. Dept. of Agriculture
Permit No. G-145

** FRMLNSERIA300SB MAY92 R 1
** SERIALS PROCESSING
** UNIV MICROFILMS INTL
** 300 N ZEEB RD
** ANN ARBOR MI 48106

Subscribe today! Call Our New TOLL-FREE number:

1-800-999-6779

To get the **whole** picture you need **all** the facts. . .

Order these Economic Research Service periodicals:

FARMLINE. Written for farmers, farm-related businesses, and others in agriculture. Concise articles, supported by charts and statistics, explain how the economic environment for agriculture is changing here and abroad. Focus is on the consequences of those changes for people in agriculture.

National Food Review. Covers the latest developments in food prices, marketing margins, consumption trends, nutrition, food retailing, product safety, export opportunities, and processing technology for those who manage or monitor the nation's food system.

Agricultural Outlook. Presents USDA's farm income and food price forecasts. Emphasizes short-term outlook, but also presents long-term analyses. Issues range from trade to commodity supply-demand prospects. Includes more than 20 pages of statistical indicators.

How to order
For fast, personal service, call and order today. Our toll-free lines are open weekdays, 8:30-5:00 Eastern Time. Or complete the order form and return to us.

*Order **now** by calling*
1-800-999-6779
Charge your order to MasterCard or VISA

Please check the appropriate boxes:

	1 Year	2 Years	3 Years
FARMLINE (11 issues per year)			
U.S. addresses	☐ $12	☐ $23	☐ $33
Foreign addresses	☐ $15	☐ $28.75	☐ $41.25
National Food Review (4 issues per year)			
U.S. addresses	☐ $11	☐ $21	☐ $30
Foreign addresses	☐ $13.75	☐ $26.25	☐ $37.50
Agricultural Outlook (11 issues per year)			
U.S. addresses	☐ $26	☐ $51	☐ $75
Foreign addresses	☐ $32.50	☐ $63.75	☐ $93.75

Total charges: $_____

Mail to: ERS-NASS
P.O. Box 1608
Rockville, MD 20849-1608

☐ Enclosed is my check or money order payable to ERS-NASS.
☐ Please bill me.
Charge to my ☐ MasterCard ☐ VISA

Acct. No. _____ Expires _____

Please print or type:

Name _____

Company or organization _____

Street address or P.O. Box _____

City, State, ZIP _____

Day telephone no. ( ) _____